CLAIMS

1. Metal oxide-based phosphor microfine particles comprising a matrix crystal made of a metal oxide and a metal element doped as an emission center into the matrix crystal, wherein said microfine particles are provided with an organic group coordinated to a surface thereof.

2. The metal oxide-based phosphor microfine particles according to claim 1, wherein said organic group is a residue of an organic compound having one or more functional groups bonded to a terminal end or a side chain thereof which residue is formed by dissociating at least one of the functional groups from the organic compound.

3. The metal oxide-based phosphor microfine particles according to claim 2, wherein said functional groups are OH groups.

4. The metal oxide-based phosphor microfine particles according to claim 1, wherein said metal element as the emission center is a rare earth element.

5. The metal oxide-based phosphor microfine particles according to claim 4, wherein said rare earth element is at least one element selected from the group consisting of europium (Eu), terbium (Tb), praseodymium (Pr), cerium (Ce), samarium (Sm), thulium (Tm), dysprosium (Dy) and lutetium (Lu).

6. The metal oxide-based phosphor microfine particles according to claim 1, wherein a metal element contained in the metal oxide constituting the matrix crystal is at least one element selected from the group consisting of yttrium (Y), aluminum (Al), gadolinium (Gd), lanthanum (La), gallium (Ga) and barium (Ba), and the metal element as the emission center is at least one element selected from the group consisting of europium (Eu), cerium (Ce) and

terbium (Tb).

7. A dispersion of metal oxide-based phosphor microfine particles comprising:

(a) a dispersing medium containing an organic compound having one or more functional groups bonded to a terminal end or a side chain thereof; and

(b) the metal oxide-based phosphor microfine particles comprising a matrix crystal made of a metal oxide and a metal element doped as an emission center into the matrix crystal, wherein said microfine particles are provided with an organic group coordinated to a surface thereof which is formed by dissociating at least one of the functional groups from the organic compound.

8. The dispersion of metal oxide-based phosphor microfine particles according to claim 7, wherein said functional groups are OH groups.

9. The dispersion of metal oxide-based phosphor microfine particles according to claim 7, further comprising (c) a resin component.

10. The dispersion of metal oxide-based phosphor microfine particles according to claim 9, wherein said resin component is a light-transmittable resin.

11. A fluorescent conversion film comprising a light-transmittable resin and the metal oxide-based phosphor microfine particles as defined in any one of claims 1 to 6 which are dispersed in the light-transmittable resin.

12. A process for producing metal oxide-based phosphor microfine particles, comprising:

dissolving or dispersing a compound of a metal element forming a matrix made of a metal oxide and a compound of a metal element as an emission center in a dispersing medium containing an organic compound having one or more functional groups bonded to a terminal end or a side chain thereof to prepare a solution;

enclosing the solution in a pressure container; and

heating the solution at a temperature not lower than a boiling point of the organic compound.

13. The process for producing metal oxide-based phosphor microfine particles according to claim 12, wherein said functional groups are OH groups.

14. The process for producing metal oxide-based phosphor microfine particles according to claim 12, wherein said compound of the metal element forming the matrix made of the metal oxide and said compound of the metal element as the emission center are respectively at least one compound selected from the group consisting of carbonates, acetates, nitrates, hydroxides, sulfates, phosphates, borates, silicates, aluminates, carboxylates, halides, alkoxides and hydrates of these compounds.

15. A method of separating metal oxide-based phosphor microfine particles comprising:

subjecting a mixture of the metal oxide-based phosphor microfine particles and a solvent to centrifugal separation, filtration, natural sedimentation or combination thereof for classifying the microfine particles to separate transparent metal oxide-based phosphor microfine particles containing the solvent from the mixture.

16. A method of separating metal oxide-based phosphor microfine

particles comprising:

mixing a mixture of the metal oxide-based phosphor microfine particles and a solvent, with a solvent capable of varying a dispersing condition of the microfine particles, and

subjecting the resultant mixture to centrifugal separation, filtration, natural sedimentation or combination thereof for classifying the microfine particles to separate transparent metal oxide-based phosphor microfine particles containing the solvent from the mixture.

17. A transparent fluorescent liquid comprising a solvent and 10% by weight or more of the metal oxide-based phosphor microfine particles as defined in claim 1, wherein light emitted from the metal oxide-based phosphor microfine particles which has a wavelength attributed to the metal oxide contained therein is transmitted through the fluorescent liquid at a transmittance of 50% or more in terms of an optical path length of 1 cm.

18. A transparent fluorescent paste comprising a solvent and 50% by weight or more of the metal oxide-based phosphor microfine particles as defined in claim 1, wherein light emitted from the metal oxide-based phosphor microfine particles which has a wavelength attributed to the metal oxide contained therein is transmitted through the fluorescent paste at a transmittance of 50% or more in terms of an optical path length of 150 μm.

19. A phosphor produced by baking the fluorescent liquid as defined in claim 17 at a temperature of 500°C or lower.

20. A phosphor produced by baking the fluorescent paste as defined in claim 18 at a temperature of 500°C or lower.

21. A process for producing a phosphor comprising:

baking the fluorescent liquid as defined in claim 17 at a temperature of 500°C or lower.

22. A process for producing a phosphor comprising:

baking the fluorescent paste as defined in claim 18 at a temperature of 500°C or higher.

23. A fluorescent converter comprising the phosphor as defined in claim 17 or 18 solely, or a product obtained by adding a resin and/or a solvent to the phosphor and solidifying the obtained mixture.

24 A fluorescent converter obtained by dispersing the phosphor as defined in claim 17 or 18 in a resin and/or a solvent.